sont continue sur $[0,1]$

Donc $$\int_0^1 \frac{u^{2n+1}}{\sqrt{x^2+1}}\,dx \leq \int_0^1 u^{2n+1}\,dx$$

$$\Rightarrow I_n \leq \left[\frac{u^{2n+2}}{2n+2}\right]_0^1$$

$$\boxed{I_n \leq \frac{1}{2n+2}}$$

Ainsi

$$\boxed{0 \leq I_n \leq \frac{1}{2n+2}}$$

or $\lim\limits_{n\to+\infty} \frac{1}{2n+2} = 0$

$$0 \leq I_n \leq \frac{1}{2n+2} \to 0$$

Donc

$$\boxed{\lim_{n\to+\infty} I_n = 0}$$